

## REMARKS

Claims 1-59 are pending. Claims 20, 28, 33 and 40-51 are withdrawn as being directed to a non-elected species.

Claims 2, 16-18, 21, 24-27, 29-32, 34-39 and 53-59 stand rejected under 35 U.S.C. § 112, first paragraph as lacking enablement for halogenide in a liquid solution, and for wet etching of a noble metal. The Examiner states that the specification does not enable any person skilled in the art to which it pertains to use the invention commensurate in scope with the rejected claims. The Examiner further states that "it is well known in the art that in order to etch a noble metal, there must be a complex and an oxidizer" and indicates that the specification does not enable the etch recited in the claims because the "instant application fails to teach a complex and an oxidizer when wet etching the noble metal". Applicant notes that the Examiner has not provided a basis the statement that "there must be a complex and an oxidizer in order to etch a noble metal". Further, it is not clear what the Examiner considers to be "a complex" or "an oxidizer". Applicant therefore respectfully requests that clarification be provided if such rejection is to be maintained in the Examiner's next action. Specifically, applicant requests that the Examiner provide a definition of what the Examiner considers to be "a complex" and "an oxidizer", and provide a basis for the Examiner's statement requiring such elements, to allow applicant to address any rejection maintained on this basis.

The Examiner further indicates at page 4 of the present Action that the lack of enablement rejection is further based upon the prior art teaching away from wet etching a noble metal and/or teaching that "platinum films cannot be patterned by wet etching, only by dry etching or ion milling". The Examiner indicates reliance on Saito, U.S. Patent No. 6,144,871, as teaching that platinum films cannot be patterned by wet etching, with

reference to column 9, lines 60-63; and column 12, lines 27-29. The Examiner is mistaken. Referring initially to column 9, lines 60-63, Saito clearly indicates that patterning a platinum film by a wet etch is difficult. Similarly, at column 12, lines 27-29 Saito indicates "it is difficult to wet etch the platinum film" (emphasis added). This disclosure does not teach that "platinum films cannot be patterned by wet etching" as indicated by the Examiner. Relying upon Saito; Evans, U.S. Patent No. 6,290,736; and Fraser, U.S. Patent No. 4,039,698, the Examiner indicates that since prior art explicitly teaches away from wet etching a noble metal, the applicant's specification does not enable a person skilled in the art to perform wet etching of a noble metal. Each of Saito, Evans and Fraser indicate that wet etching noble metals can be difficult or problematic. Not one of these references indicates that wet etching cannot be utilized for etching noble metals. Accordingly, the teaching away aspect of Saito, Evans and Fraser does not support the lack of enablement rejection set forth by the Examiner.

In the present instance, the Examiner indicates that the specification does not reasonably provide enablement for halogenide in liquid solution and for wet etching of noble metal. As indicated in MPEP § 2164.04, the burden under the enablement requirement is upon the Examiner "to establish a reasonable basis to question the enablement provided for the claimed invention" (citing *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)). This section of the MPEP clearly indicates that the specification disclosure is presumptively accurate and that to support a rejection based on lack of enablement the Examiner must explain why accuracy of any statement is doubted.

Directing attention to applicant's specification at page 8, the disclosure indicates etching at least a portion of a metal layer 16 comprising at least one of platinum,

ruthenium, rhodium, palladium and iridium utilizing a halogenide, ozone and H<sub>2</sub>O. This portion of the specification indicates that the halogenide is from the group consisting of fluoride, chloride, bromide, iodide and mixtures thereof. Additionally, the specification indicates that the etching method can utilize providing the halogenide in liquid solution to the portion of layer 16 to be etched. The ozone can be provided in gaseous form either as part of the liquid or separately. This portion of the specification further defines "liquid solution" as a solution wherein at least 70% by volume is in liquid form. Preferred solutions are set forth at the bottom of page 8 through the top of page 9.

At page 9, the specification additionally describes methods of providing the liquid solution for etching. Additionally, preferred processing tools for providing liquid solution are indicated at the bottom of page 9 including a specific tool utilized during reduction to practice (pages 9-10). The Examiner has not provided a reasonable basis to question this presumptively accurate disclosure and has therefore not provided a reasonable basis to question enablement of the etch as recited in the claims. Accordingly, a *prima facie* case of lack of enablement has not been established and applicant respectfully requests withdrawal of the § 112 rejection of claims 2, 16-18, 21, 24-27, 29-32, 34-39 and 53-59 in the Examiner's next action.

The specification and the claims under consideration stand objected to due to informalities. The Examiner indicates at pages 4-5 of the present Action that chemical formulas or the first word in a chemical formula must be capitalized. The Examiner further requires capitalization of all elements. Applicant notes that the Examiner has not provided any basis for such capitalization requirements. If such objections are to be maintained in the Examiner's next action, applicant respectfully requests direction to a relied upon authority for such requirement. Submitted herewith for the Examiner's consideration as to

appropriate capitalization of elements in chemical formulas are the relevant sections of the Chicago Manual of Style 14<sup>th</sup> Edition (page 280, § 7.121) and the CBE Manual for Authors, Editors and Publishers 6<sup>th</sup> Edition (Scientific Style and Format, page 254, § 15.5). Each of these two manuals indicates that written out chemical elements and compounds should be lowercase. Applicant further notes that the each U.S. Patent reference and the English translation of the Japanese reference cited by the Examiner in the present Action consistently utilize lowercase when writing out elements and compounds throughout the text of the corresponding specifications, including the claims. Applicant therefore requests reconsideration of the objections to the specification and claims based on capitalization.

Claims 1, 3-15 and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Takeshi, JP 08-153707. The Examiner is reminded by direction to MPEP § 2131 that anticipation requires disclosure of each and every element of a claim in a single prior art reference. Each of claims 1, 3-15 and 19 are allowable over Takeshi for at least the reason that Takeshi fails to disclose each and every element in any of those claims.

Independent claim 1 recites etching at least a portion of a layer in an ambient which comprises halogenide, ozone and H<sub>2</sub>O. The layer comprises elemental metal or a metal alloy comprising platinum, ruthenium, rhodium, palladium, or mixtures thereof. The Examiner indicates at page 5 of the present Action that Takeshi discloses etching a metal comprising Pt, Ru, Rh, Pd, Ir or mixtures thereof utilizing an ambient comprising halogenide, O<sub>3</sub> and H<sub>2</sub>O (referencing abstracts and paragraphs 14, 18, 20, 23 and claims 1-7). The Examiner is mistaken.

Referring initially to the Technical Problem section, Takeshi indicates that the invention involves removing a contamination from a front face of an electrode utilizing a surface treatment method. The contamination results from dry etching of platinum or a

conductive oxide. Referring next to paragraphs 14-16, Takeshi discloses formation of a RuO<sub>2</sub> film 14 and a Spin on Glass (SOG) film 15. The SOG film is then etched utilizing dry etching conditions. The RuO<sub>2</sub> film 14 is subsequently etched utilizing a mixed gas of oxygen and chlorine. The dry etching of films 14 and 15 are disclosed as producing "pollution layer 17".

Takeshi discloses that pollution layer 17 is removed by a surface treatment. The surface treatment is indicated as utilizing plasma generated from oxygen gas. At paragraph 18, Takeshi indicates that the surface treatment can be effective if it utilizes ozone, steam or nitrogen gas in place of oxygen. Nowhere does Takeshi disclose utilization of a combination comprising halogenide, O<sub>3</sub> and H<sub>2</sub>O, or the claim 1 recited etching at least a portion of an elemental metal or metal alloy layer in an ambient comprising halogenide, ozone and H<sub>2</sub>O. Accordingly, independent claim 1 is not anticipated by Takeshi and is allowable over this reference.

Dependent claims 3-15 and 19 are allowable over Takeshi for at least the reason that they depend from allowable base claim 1.

Claims 2, 16-18, 21-32, 34-39 and 52-59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeshi in view of Evans, U.S. Patent No. 6,290,736. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 2, 16-18, 21-32, 34-39 and 52-59 are allowable over Takeshi and Evans for at least the reason that the references, individually or as combined, fail to disclose or suggest each and every limitation in any of those claims.

As indicated above, Takeshi does not disclose the claim 1 recited etching a portion of a layer comprising platinum, ruthenium, rhodium, palladium, iridium or mixtures thereof utilizing an ambient comprising a halogenide, ozone and H<sub>2</sub>O. Further, Takeshi does not suggest these recited features and claim 1 is not rendered obvious by Takeshi. Evans discloses a chemical mechanical polishing system comprising a slurry containing a strongly basic aqueous solution which includes elemental halogen (col. 2, ll. 30-42). Evans does not disclose or suggest the claim 1 recited halogenide, ozone and H<sub>2</sub>O comprising ambient, or the recited etching of elemental metal or metal alloy utilizing the recited ambient. As combined with Takeshi, Evans does not contribute toward suggesting the claim 1 recited etching a portion of a metal layer containing platinum, ruthenium, rhodium, palladium, iridium or mixtures thereof utilizing an ambient comprising halogenide, ozone and H<sub>2</sub>O. Accordingly, independent claim 1 is not rendered obvious by the cited combination of Takeshi and Evans and is allowable over these references.

Dependent claims 2 and 16-18 are allowable over the cited combination of Takeshi and Evans for at least the reason that they depend from allowable base claim 1. Further, the Examiner specifically indicates at page 4 of the present Action that Evans teaches away from the inventions recited in claims 2 and 16-18. Accordingly, Evans cannot properly be combined as a basis for a § 103 rejection of claims 2 and 16-18.

Independent claim 21 recites wet etching a portion of a layer comprising platinum, ruthenium, rhodium, iridium or mixtures thereof using an aqueous halogenide-ion-containing liquid solution and ozone. Independent claim 30 recites spraying an aqueous halogenide-ion-containing liquid solution and providing gaseous ozone during the spraying to etch at least a portion of a layer comprising platinum, ruthenium, rhodium, palladium iridium, and mixtures thereof. Independent claim 52 recites etching an exposed portion of

an electrode comprising metal or metal alloy containing platinum, ruthenium, rhodium, palladium, iridium or mixtures thereof, the etching utilizing a halogenide, ozone and H<sub>2</sub>O comprising ambient. Each of independent claims 21, 31 and 52, and their corresponding dependent claims are allowable over the cited combination of Takeshi and Evans for at least reasons similar to those discussed above with respect to independent claim 1 and its corresponding dependent claims.

Applicant acknowledges the status of claims 20, 28, 33 and 40-51 as being withdrawn by the Examiner as being directed toward non-elected species. As indicated above, independent claims 1, 21 and 30 are allowable. Accordingly, applicant respectfully requests consideration of dependent claims 20, 28 and 33 as depending from corresponding allowable generic claims in accordance with MPEP § 809.04. Claims 20, 28 and 33 are allowable for at least the reason that they depend from corresponding allowable base claims 1, 21 and 30.

For the reasons discussed above, claims 1-39 and 52-59 are allowable. Accordingly, applicant respectfully requests formal allowance of claims 1-39 and 52-59 in the Examiner's next action.

Respectfully submitted,

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## 7.119 / NAMES AND TERMS

In streptococemia, or streptococcal infection, microorganisms of the genus *Streptococcus* are present in the blood.

The disease trichinosis is characterized by infestation by trichinae, small parasitic nematodes. It is commonly caused by eating underdone pork containing *Trichinella spiralis*.

Chicago  
Manual of  
Style  
14<sup>th</sup>  
Edition

## Pharmaceuticals

- 7.119 Generic names of pharmaceuticals should be used so far as possible and given lowercase treatment. Proprietary names (trade names or brands), if used at all, should be capitalized and enclosed within parentheses after the first use of the generic term:

The patient was kept tranquilized with meprobamate (Miltown).

## Physical and Chemical Terms

## LAWS, PRINCIPLES, AND THE LIKE

- 7.120 Only proper names attached to the names of laws, theorems, principles, and the like are capitalized:

big bang theory  
Boyle's law  
Avogadro's theorem  
Planck's constant  
(Einstein's) general theory of relativity  
the second law of thermodynamics  
Newton's first law



## CHEMICAL NAMES AND SYMBOLS

- 7.121 Names of chemical elements and compounds are lowercased when written out; the chemical symbols, however, are capitalized and set without periods (for a list of symbols for the elements see 14.54):

sulfuric acid;  $H_2SO_4$   
sodium chloride; NaCl

tungsten carbide; WC  
ozone; O<sub>3</sub>

The numeral giving the number of atoms in a molecule is placed in the inferior position after the symbol for the element, as in the examples above.

- 7.122 The mass number, formerly placed in the superior position to the right of the element symbol, is now according to international agreement placed in the superior position to the left of the symbol:  $^{238}\text{U}$ ,  $^{14}\text{C}$ . In



## SUBATOMIC PARTICLES, CHEMICAL ELEMENTS, RELATED NOTATIONS

Table 15-3 Nuclear particles

Name	Symbol and comment
photon (also "gamma")	$\gamma$
neutrino	$\nu, \nu^0, \nu^-, \nu^+$
electron	$e, \beta$ [do not confuse "e" with "e", the symbol for elementary charge]
positron	$e^+$
muon	$\mu$ [may be positively or negatively charged]
tau (also "tauron")	$\tau$ [may be positively or negatively charged]
pion	$\pi$ [may be neutral or positively or negatively charged]
nucleon	$N$ [often used either with mass within parentheses after it for the resonances, for example, " $N(1440)$ ", or with other particle symbols when indicating the products of a reaction, for example, " $\pi\pi N$ "; it should be used by itself only when there is no possibility of confusion with "N" for "nitrogen"]
neutron	$n$
proton	$p$ [ ${}^1\text{H}^+$ ]
deuteron	$d$ [ ${}^2\text{H}^+$ ]
triton	$t$ [ ${}^3\text{H}^+$ ]
helion	$h$ [ ${}^3\text{He}^{2+}$ ]
$\alpha$ particle	$\alpha$ [ ${}^4\text{He}^{2+}$ ]

The notation for a nuclear reaction should have the following unspaced sequence of symbols: initial nuclide (incoming particle or photon, outgoing particle[s] or photon[s]) final nuclide.



## CHEMICAL ELEMENTS

- 15-5 The symbols for the chemical elements are in general derived from their latin or greek names and consist of 1, 2, or 3 letters (for example: H from "hydrogen"; K from "kalium"; Na from "natrium"; Ca from "calcium"; Unh from "unnilhexium", element 106). They must be printed in roman type with the initial letter capitalized. The 3-letter symbols are used for elements of atomic number greater than 103 until internationally accepted names and corresponding symbols are adopted for them. The names for the elements should be written in lowercase letters except at the beginning of a sentence or for other appropriate reasons such as capitalization in book titles. For the names and symbols for the chemical elements through atomic number 109, see Table 15-4.

The following roots have been selected for the formation of interim systematic names of the elements with atomic numbers above 103.

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